WHAT IS CLAIMED IS:

1. A method of writing a light guiding structure inside of a bulk glass substrate comprising:

a) selecting a bulk glass substrate made from a soft silica-based material; and

b) focusing a deep UV laser beam within the material to a focus while translating the focus relative to the substrate along a scan path at a scan speed effective to induce an increase in the density of the material along the scan path relative to that of the unexposed material while incurring substantially no laser induced breakdown of the material along the scan path.

2. A method as claimed in claim 1, wherein selecting bulk glass substrate includes selecting a bulk glass substrate with a substantially homogeneous composition and a substantially homogeneous refractive index.

3. The method of claim 1, wherein said soft silica glass material has an annealing point lower than about 1350°K.

4. The method of claim 1, wherein the soft silica glass material has an annealing point lower than about 1325°K.

5. The method of claim 1, wherein the material is substantially transparent to the laser wavelength.

6. The method of claim 1, wherein the soft silica glass material includes a silica glass softening dopant.

7. The method of claim 1, wherein the material includes a first softening dopant selected from the group consisting of GeO_2, B_2O_3, Al_2O_3, and P_2O_5.

8. The method of claim 7, wherein said material is homogeneously doped with said first dopant.

9. The method of claim 1, wherein said laser beam has a wavelength less than 250 nm.

10. The method of claim 1, wherein said laser beam has a wavelength less than 200 nm.

11. The method of claim 7 wherein said material further includes a second softening dopant different in composition from said first softening dopant, said second dopant being selected from the group consisting of GeO_2, B_2O_3, Al_2O_3, and P_2O_5.

12. A method of claim 1, wherein the induced increase in density provides a refractive index change of at least 1×10^{-5}.

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13. A method of claim 1, wherein the induced increase in density provides a refractive index change of at least 1×10^{-4}.

14. A method of claim 1, wherein the glass substrate is free of germanium.

15. An optical device formed according to the method of claim 1.

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16. A method of writing a light guiding structure comprising:

a) selecting a silica-based bulk glass substrate a material;

focusing a below 300 nm laser within said substrate while translating the focus relative to the substrate along a scan path at a scan speed effective to densify and induce an increase in the refractive index of the material along the scan path relative to that of the unexposed material while incurring substantially no laser induced breakdown of the material along the scan path, said induced increased refractive index scan path comprising an optical waveguide core formed within the bulk glass substrate material with the unexposed material outside of the scan path focus providing an optical waveguide cladding surrounding said formed core.

17. A method as claimed in claim 16, wherein selecting said silica-based bulk glass substrate material includes selecting a glass with a substantially homogenous composition.

18. A method as claimed in claim 16, wherein selecting said silica-based bulk glass substrate material includes selecting a glass with a substantially homogenous refractive index.

19. A method as claimed in claim 18 wherein said selected glass substrate has an optical index homogeneity of $\Delta n \leq 5$ ppm.

20. A method of writing a light guiding structure in a bulk glass substrate comprising:

selecting a bulk glass substrate made from a silica-based material doped with a dopant selected from the group consisting of B_2O_3, Al_2O_3 and P_2O_5; and

focusing a deep UV laser beam at a focus within said substrate while translating the focus relative to the substrate along a scan path at a scan speed effective to induce an increase in the refractive index of the material along the scan path relative to that of the unexposed material while incurring substantially no laser induced breakdown of the material along the scan path.

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21. A method as claimed in claim 20 wherein selecting a doped silica-based material bulk glass substrate includes softening the silica-based material with a softening dopant.

22. A method as claimed in claim 20 wherein said selected doped silica-based material has an annealing point less than about 1350 ° K.

23. A method as claimed in claim 20 wherein said silica-based material is homogeneously doped with said selected dopant.

24. A method as claimed in claim 20 wherein said silica-based material has an optical homogeneity of $\Delta n \leq 50$ ppm.

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25. A method of making a three dimensional structure within an interior of a glass body, said method comprising:

providing a glass body, said glass body having an interior, said interior having a homogeneous composition and refractive index,

providing a laser beam and a lense,

coupling said laser beam into said lense to form a converging focused laser beam having a refractive index increasing focus,

positioning said focus inside said glass body interior and controlling relative motion between said focus and said glass body, wherein said focus forms a raised refractive index waveguiding core within said glass body, said raised refractive index waveguiding core for guiding light and cladded by said glass body.

26. A method as claimed in claim 25, said glass body having a first exterior side and a second exterior side, said first exterior side lying in a first plane, said second exterior side lying in a second plane, said second plane non-parallel to said first plane, wherein said waveguiding core traverses from an input at said first exterior side to an output at said second exterior side.

27. A method as claimed in claim 25, said glass body having a planar exterior base side, wherein said waveguiding core tunnels in a plane non-parallel to said planar base side.

28. A method as claimed in claim 25, said method including forming a first raised refractive index waveguiding densified core path, a second raised refractive index waveguiding densified core path, and a third raised refractive index waveguiding densified core path , wherein said third core is in a plane separate from said first core and said second core.

29. A method as claimed in claim 25, said providing a glass body including providing a glass homogeneously doped with a glass softening dopant.

30. A method as claimed in claim 25, said providing a glass body including providing a glass with an index homogeneity of $\Delta n \leq 5$ ppm.

31. A method as claimed in claim 25, said laser beam having a wavelength λ_{Laser}, and said glass body having an internal transmission of at least 50%/cm at λ_{Laser}.

32. A method as claimed in claim 25, wherein said focus forms a refractive index increase of at least 1 X 10^{-5} at 633 nm.

33. A method as claimed in claim 25, wherein said focus forms a refractive index increase of at least 1 X 10^{-4} at 633 nm.

34. A method as claimed in claim 25, wherein providing a laser beam includes providing an excimer laser.

35. A method as claimed in claim 25, wherein providing a laser beam includes providing a solid state laser.

36. A method as claimed in claim 25, wherein providing a laser beam includes providing a 193nm excimer laser.

37. A method as claimed in claim 25, wherein providing a laser beam includes providing a 248nm excimer laser.

38. A method as claimed in claim 25, said method including forming a first raised refractive index waveguiding densified core and a second raised refractive index waveguiding densified core wherein guided light is coupled from said first core to said second core.

Sub B2 39. A method as claimed in claim 25, wherein said method includes forming a wavelength division multiplexer for multiplexing a plurality of optical wavelength channels, said forming including forming a plurality of waveguiding core inputs for separately inputting the plurality of optical wavelength channels, forming a multiplexing region for multiplexing said inputted channels, and forming an output waveguiding core for outputting said multiplexed inputted channels.

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